

# Nicholas Vadivelu

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Experience	<b>NVIDIA</b> • Performance Software Engineering Intern Aug 2020 – Present <ul style="list-style-type: none"><li>Optimizing sparse BERT inference performance for <b>TensorRT</b> in <b>C++</b>, enabling a potential <b>50% reduction</b> in inference time, memory usage, and power usage for customers</li></ul>
	<b>Google Brain</b> • Software Engineering Intern May 2019 – Aug 2019 <ul style="list-style-type: none"><li>Unlocked K-FAC for <b>over 370,000 users</b> by implementing and open sourcing automatic support for arbitrary neural network architectures and integrating it into the Keras ecosystem</li><li>Enabled simple <b>multi-node, multi-GPU/TPU training</b> for users by incorporating <b>TensorFlow's</b> Distribution Strategy and efficient distributed operation placement</li><li>Designed, created, and open-sourced idiomatic, reproducible training recipes for users while carefully considering hyperparameter ranges, baselines, datasets, and models</li></ul>
	<b>Uber ATG</b> • Research Intern Jan 2020 – Aug 2020 <ul style="list-style-type: none"><li>Improved <b>object detection by 90%</b> (AP) and <b>motion forecasting by 22%</b> (L2) of a self-driving neural net under realistic positional error, significantly improving safety for future riders</li><li>Wrote a <b>first author paper</b> on the learned positional error correction system (under review at CoRL)</li></ul>
	<b>John Hancock Financial</b> • Data Science Intern May 2018 – Aug 2018 <ul style="list-style-type: none"><li>Achieved a <b>fraud detection rate of 63%</b> through designing an unsupervised ML model</li><li>Deployed 25 fraud identifying rules in <b>SQL</b> that <b>correctly flagged 100+ out of 20,000+</b> claims</li></ul>
	<b>Sunnybrook Research Institute</b> • Software Developer Intern Jul 2017 – Aug 2017 <ul style="list-style-type: none"><li>Improved MRI segmentation accuracy by <b>up to 80%</b> and reduced time to contour MRI scans from <b>~5 hrs to ~40 mins</b> by implementing techniques including watershed and clustering</li></ul>
Open Source	<b>PyTorch Ignite</b> : Improved performance by <b>up to 63%</b> by designing and implementing <b>async updates for distributed metrics</b> with tests and documentation
Projects	<b>Thrive Life Simulator</b> : Created a <b>3D ray-casting game engine</b> from scratch for a dinosaur world simulation game in <b>Java</b> with <b>object-oriented design</b> and detailed documentation <b>PixelShot 300</b> : Built a one-pixel camera from scratch capable of capturing a 300x300 photo using techniques such as proto-threading in <b>Arduino</b> and <b>Java</b> <b>Vim Clone</b> : Recreated the text editor using <b>object-oriented design</b> and <b>C++</b> best practices, such as implementing the <b>Model-View-Controller</b> pattern and extensively using STL functionality
Leadership	<b>Data Science Club Lectures</b> : Designed and presented workshops about neural networks in <b>TensorFlow</b> , machine learning in <b>scikit-learn</b> , and data cleaning in <b>pandas</b> for <b>300+ students</b> <b>WATonomous Design Team</b> : Implemented real-time object detection in <b>Tensorflow</b> , <b>OpenCV</b>
Education	<b>University of Waterloo</b> • Computer Science & Statistics (B. Math) 2017 - 2022 Cumulative GPA: 3.94/4.00 - Dean's List <ul style="list-style-type: none"><li>Research (Prof. Lin Tan): Proposed and implemented deep learning methods to identify bugs in code</li><li>Research (Prof. Pascal Poupart): Investigated practical second order optimization methods for NNs</li></ul>